

**MICROFLUIDIC APPARATUS WITH INTEGRATED POROUS-SUBSTRATES/SENSOR FOR REAL-TIME(BIO)CHEMICAL MOLECULE DETECTION**

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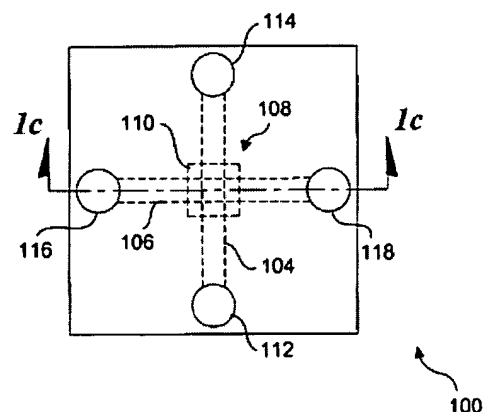
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Microfluidic apparatus including integrated porous substrate/sensors that may be used for detecting targeted biological and chemical molecules and compounds. In one aspect, upper and lower microfluidic channels are defined in respective halves of a substrate, which are sandwiched around a porous membrane upon assembly. In another aspect, the upper and lower channels are formed such that a portion of the lower channel passes beneath a portion of the upper channel to form a cross-channel area, wherein the membrane is disposed between the two channels. In various embodiments, one or more porous membranes are disposed proximate to corresponding cross-channel areas defined by one or more upper and lower channels. The porous membrane may also have sensing characteristics, such that it produces a change in an optical and/or electronic characteristic. Accordingly, the apparatus may further include instrumentation or detection equipment to measure the changes, such as optic-based detectors and electronic instrumentation.



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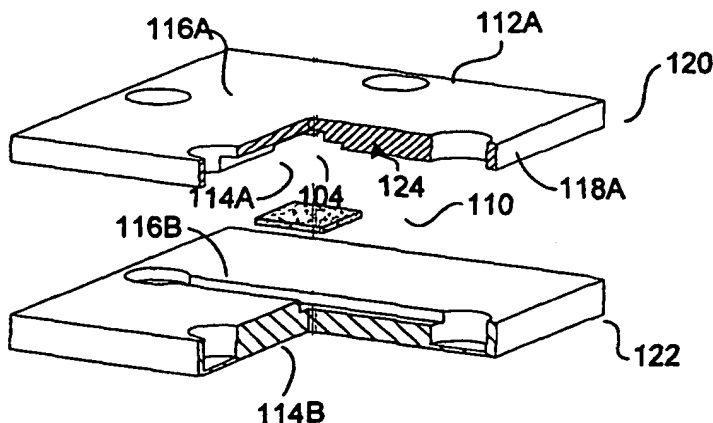
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Accordingly, the apparatus may further include instrumentation or detection equipment to measure the changes, such as optic-based detectors and electronic instrumentation.